INDICATOR

Cross-References to Related Applications

This application claims priority under 35 U.S.C. § 119 (e) to, and hereby incorporates by reference, U.S. Provisional Application No. 60/425,385, filed 12 November 2002.

Background of the Invention

1. Field of the Invention

This invention relates to indicators and, in particular, this invention relates to devices for indicating locations of sites over which a substantially flowable material will subsequently be applied.

2. Background of the Invention

Standard construction practice often involves installing devices such as floor drains, floor cleanouts, and electrical boxes, then forming a floor by applying a layer of concrete. Before the concrete hardens, the floor is finished to desired depths and contours around these devices. Often a finished floor covering such as tile or linoleum is then applied over the concrete. The devices must be situated and the concrete formed so that the devices are accessible and so that liquids will flow into them if they are drains. To this end, many of these fixtures must be substantially level with, or slightly above, the final surfaces of the cement slab.

Ideally, openings into the devices are blocked with tape or by some other method so that the concrete will not flow into the devices when being poured. Then, the locations of the devices are noted by persons installing the concrete. The concrete is then poured, leveled, and contoured to expose and provide drainage to the devices if desired. After the cement has been poured but before finishing, the locations of a these devices are not readily ascertainable by visual inspection or memory. Moreover, persons responsible for finishing the concrete do not have access to detailed plans and/or are not present when the fixtures were installed and the layer of concrete was applied. However, if the locations of the installed devices become unknown when concrete is being poured, portions of the concrete must often be removed until the fixtures are located. Then, more concrete must be poured to form a floor with the desired

contours and depths around these devices. To this end, large inefficient amounts of time and effort are often required to locate fixtures buried and invisible beneath hardened concrete and to reform floors to required depths and contours around these devices.

In order for construction to proceed efficiently and economically these devices must be readily identified so that cement can be formed to required depths and contours with minimum amounts of time and effort. Therefore, a cost effective, reliable device and method for locating fixtures beneath poured, but yet unhardened, concrete is needed.

Summary of the Invention

This invention substantially meets the aforementioned needs of the industry by providing a device and method for identifying locations of devices as concrete is poured and finished.

The present invention provides an indicator for identifying and/or locating devices beneath a layer of materials being applied as a flowable substance, such as concrete. The device may include a basal portion and an indicator portion. The indicator portion may be disposed generally transversely with respect to the basal portion. The indicator portion may include a plurality of generally resilient strands. In one embodiment, the present locator device includes a separate vertical element and horizontal element. The vertical element possesses requisite resilience so that a portion of the vertical element will be visible above the poured concrete and so that the vertical element will return to a visible, substantially vertical orientation after the concrete layer has been applied, thereby indicating the location of the device. The basal portion may be attachable to the vertical element and may have a portion conforming to a generally horizontal surface on, or proximate, the device to be identified and/or located.

There is also provided a method of indicating a site over which a substantially flowable material is being applied, the method including disposing a base of an indicator on a generally horizontal surface proximate the site such that a resilient portion of the indicator is disposed generally transversely to the indicator base and is generally vertically oriented; and adhering the indicator base to the horizontal surface.

It is a feature of the present invention to include a substantially resilient indicator or vertical element.

It is an advantage of the foregoing feature that, if biased from a visible, generally vertical orientation by the flowing concrete (thereby becoming invisible), the indicator will rebound back to the generally vertical orientation to again become visible, thereby indicating the location of an underlying or adjacent device.

It is another advantage of the foregoing feature that the flexible, resilient indicator does not interfere or hinder pouring or finishing the concrete layer.

It is another feature of the present invention to include a base conformable to a substantially horizontal surface.

It is an advantage of the foregoing feature that the instant device base can be attached to a substantially horizontal surface quickly and efficiently with materials being used to block openings of devices to be located, e.g., with tape.

It is yet another feature of one embodiment of the present invention to include a separate base and indicator portion.

It is an advantage of the foregoing feature that the separate base and indicator portion enable the present device to be easily, quickly, and efficiently manufactured, shipped, stored, and assembled.

It is yet another advantage of the foregoing feature that the separate base and indicator portion can be made from different materials for optimized economy and end use utility.

It is still yet another feature of another embodiment of the present invention to include a plurality of strands.

It is an advantage of the foregoing feature that the plurality of strands may impart required stiffness and resilience thereto.

These and other objects, features, and advantages of this invention will become apparent from the description which follows, when considered in view of the accompanying drawings.

Brief Description of the Drawings

Figure 1 is an isometric view of a first embodiment of the instant indicator;

Figure 2 is a side view of the indicator of Figure 1;

Figure 3 is a top view of the indicator of Figure 1;

Figure 4 is an exploded view of the indicator of Figure 1;

Figure 5 is a plan view of the base of the indicator of Figure 1;

Figure 6 is an isometric view of the base of Figure 5;

Figure 7 is a side view of the base of Figure 5;

Figure 8 is a side view of the indicator portion of the indicator of Figure 1;

Figure 9 is an isometric view of the indicator portion of Figure 8;

Figure 10 is a bottom view of the indicator portion of Figure 8;

Figure 11 is a plan view of another embodiment of the base of the indicator of Figure 1;

Figure 12 is a cross sectional view of one embodiment of the base of Figure 11;

Figure 13 is a side view of another embodiment of the instant indicator;

Figure 14 is a perspective view of the indicator of Figure 13;

Figure 15 is a perspective view of the embodiments depicted in Figures 1 and 11; and

Figure 16 is a perspective view of the indicator of Figure 11 installed over a fixture before a layer of cement has been applied.

It is understood that the above-described figures are only illustrative of the present invention and are not contemplated to limit the scope thereof.

Detailed Description of the Invention

Representative examples of the teachings of the present invention, which examples utilize many of these additional features and methods in conjunction, will now be described in detail with reference to the drawings. This detailed description is merely intended to teach a person of skill in the art further details for practicing preferred aspects of the present teachings and is not intended to limit the scope of the invention. Therefore, the combinations of features and methods disclosed in the following detailed description may not be necessary to practice the invention in the broadest sense and are instead taught merely to particularly describe representative embodiments of the invention. Any references to such relative terms as upper and lower, horizontal and vertical, or the like, are intended for convenience of description and are not intended to limit the present invention or its components to any one positional or spatial orientation. Each of the additional features and methods disclosed herein may be utilized separately or in conjunction with other features and methods to provide improved indicators and methods for making and using the same.

The present indicator includes a generally vertical indicator element and a generally horizontal base element. The vertical element indicates the location of a site over which a substantially flowable material, such as concrete, will subsequently be applied. The vertical element is further resilient so that the vertical element will rebound to a generally vertical orientation if the vertical element is temporarily biased away therefrom when the flowable material is being applied or formed. The vertical element may also be resilient so as not to interfere when the flowable material is being finished to a required depth and/or slope. The horizontal element provides support for the vertical element and can be secured in place so that the indicator element remains visible when the location of the site would be otherwise obscured when the flowable material is applied over the site. Because the location of the site is easily identified, the flowable material can be formed to a required depth over the marked site easily and quickly without having to resort to memory, building plans, re-measuring or removing overlaying portions of the hardened material.

Two embodiments of the present indicator are depicted in the figures. A first embodiment is shown in Figures 1-10 and 14-15 at 100 and includes a base (horizontal) element 104 and a resilient generally vertical element 108. The base 104 includes a center 110 and four legs 112, 114, 116, and 118 extending from the center 110. However, more or fewer legs could be present. The center 110 defines a generally central opening 120 defined in a raised portion 124. While the foregoing embodiment includes legs extending from a center, the instant base can have any of several geometries providing the necessary degree of functional support to the vertical element. To this end the instant base can have other geometries, e.g., round, elliptical, square, or rectangular. The resilient portion 108 includes a plurality of substantially resilient strands 128 attached at a basal portion 130 thereof to form a bundle 132. In the embodiment depicted, the strands 128 have been melted or glued together so that the basal portion is larger in diameter than the central opening 120. However, the strands 128 could be attached or gathered together by banding or other similar structures as well. Also in the embodiment shown, the basal portion 130 has a larger diameter than the base opening 120, so that the vertical element 108 will not become dislodged from the base 104 during use.

An alternate embodiment of the instant base is depicted in Figures 11 and 12 generally at 140. In the embodiment depicted, the base 140 includes a generally disk-like element 142

surrounding a raised portion 144. An opening 146 is formed in the center of the raised portion 144. In this or other embodiments, the disk-like element 142 includes an upper element 148 and an optional adhesive layer 150 attached to a lower surface of the upper element 148. When the adhesive layer 150 is present, a release layer 152 may cover a lower surface of the adhesive layer 150. Before use, the release layer is removed so that the adhesive layer can attach the present indicator to a substantially horizontal surface.

A second embodiment if the present indicator is shown in Figures 13, 15, and 16 generally at 200 and includes a plurality (e.g., four) of bundles 204, each bundle 204 having a plurality of resilient strands 206. The strands 206 of each bundle 204 are held together by a first sheath 208. The first sheaths 208 may be constructed of a material with a "memory," that is a material which will remain bent, so that the bundles 204 will retain desired shapes wherein basal and indicator portions are defined. Alternatively, the present first sheath may be pre-bent before use. The bundles 204 are, in turn, further held together by a second sheath 210. The second sheath 210 may be made from such materials as tubing, tape, or the like. In the second embodiment, a bend 212 may be formed in each of the bundles 204 so as to form a horizontal (basal) element 220 and a vertical (indicator) element 224, the basal and resilient indicator elements separated by the bends 212. Each of the present embodiments may be characterized by a base extending generally transversely with respect to an indicator portion.

The vertical elements 108 or the entirety of the bundles 204 may be formed from strands of a resilient material such as polypropylene with a thickness sufficient to impart the requisite extent of pliability, e.g., between about 0.5 millimeter and 1.0 millimeter in diameter. One suitable polypropylene is available from Smi-Carr, Inc., Abilene, Texas (U.S.A.). However, a person of ordinary skill in the art will readily recognize that other materials possessing the desired degree of resilience may be used as well. Several materials with the desired degree of resilience may be identified from the Handbook of Plastics, Elastomers, and Composites Third Edition, Charles A. Harper Editor-in-Chief, McGraw-Hill, New York, New York (1996), the entire disclosure of which is hereby incorporated by reference. The first and second sheaths may be made from the heat shrink tubing or a suitable metallic alloy with the requisite extent of memory. One suitable type of heat shrink tubing may be obtained from Gardner Bender, Milwaukee, Wisconsin. In some embodiments, a readily noticeable coloring, such as day glow orange, red, orange, or the like is

advantageously used to impart a further degree of visibility. The base 104 may be made from materials with a desired degree of rigidity to support the instant indicator. Satisfactory materials for the base 104 may include steel, rigid synthetic resins, and the like.

In use, devices such as floor drains, cleanouts, and electrical boxes are installed at desired locations, then the devices are plugged, e.g., by wrapping duct tape over the openings of these devices. The present vertical (indicator) element 108 of the indicator 100 is then threaded through the opening 120 of the base 104 or the horizontal portions of the indicator 200 are spread generally equidistantly as shown in Figures 15 and 16. If an adhesive layer is present, the release layer is separated therefrom and the base is adhered to a generally horizontal surface before the concrete is poured. Otherwise, the base is affixed to the generally horizontal surface by a length of tape 230 or other equivalent affixing structures. As can be seen in Figures 14 and 16, the indicator 100 or 200 is affixed atop a generally horizontal surface of a fixture (represented by the circle 156) to be located after a layer of cement has been poured. If the fixture does not have a generally horizontal surface, the present indicator can be affixed atop a generally horizontal surface adjacent to the fixture. After the present indicator has been attached to a generally horizontal surface, a layer of cement is poured over the fixture. When the cement is being poured and leveled, the vertical portion 108 or bundles 204 may be forced from their generally transverse positions and become temporarily invisible by the cement flow or tools being used to level the cement layer to a desired depth. However due to the resilient properties of the materials from which the vertical element 108 or bundles 204 are formed, the vertical portion 108 or bundles 204 will rebound to their former visible generally transverse (i.e., upright) orientation to indicate the locations of the devices. The cement adjacent to the marked devices is then formed to a desired depth and contour and allowed to harden. The pliability of the present vertical portion 108 or bundles 204 also allows workers to pass tools such as trowels thereover when the cement is being finished, thereby allowing the cement to be finished more quickly and efficiently. After the cement has hardened, the present indicators and materials used to block entry of liquid cement into the devices may be removed. The floor has thus been finished to a desired depth and contour around the devices without the need to locate now invisible devices beneath the poured layer of cement.

Numerous modifications of this invention may be made without departing from the

spirit thereof, the scope of the invention is not to be limited to the embodiments illustrated and described. Rather, the scope of the invention is to be determined by the appended claims and their equivalents.

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